

REMARKS

Claims 11-30 are currently pending in the application. No claims are amended, added, or canceled by this response. Reconsideration of the rejected claims in view of the following remarks is requested.

35 U.S.C. §103 Rejection

Claims 11-18, 22, and 23-30 are rejected under 35 U.S.C. §103(a) for being unpatentable over U.S. Pat. No. 2,991,672 (“Meyer”) in view of U.S. Pat. No. 4,307,592 (“Krapfenbauer”). Claims 19-21 are rejected under 35 U.S.C. §103(a) for being unpatentable over Meyer and Krapfenbauer, and further in view of U.S. Pat. No. 5,001,916 (“Schuler”). These rejections are respectfully traversed.

To establish a *prima face* case of obviousness, all claim limitations must be taught or suggested by the prior art. *See, In re Royka*, 490 F.2d 981, 985, 180 USPQ 580, 583 (CCPA 1974); *see also, In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). If the prior art reference(s) do not teach or suggest all of the claim limitations, Office personnel must explain why the differences between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art (MPEP 2141). Applicants submit that no proper combination of the applied art discloses or suggests all of the features of the claimed invention.

Claims 11-18, 22, and 23-30 in view of Meyer and Krapfenbauer

Independent Claim 11

The present invention relates to an apparatus and method for producing workpieces having a defined profiling. More specifically, independent claim 11 recites, in pertinent part:

...a first drive structured and arranged to intermittently rotate the workpiece holder about a longitudinal axis of a workpiece held in the workpiece holder;

a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool to act periodically on the workpiece; and

an electronic control operably connected to the first drive and the second drive, which controls intermittent rotational movement of the workpiece holder based upon the second drive,

wherein the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit that is oriented parallel or obliquely to the longitudinal axis of the workpiece.

The Examiner asserts that Meyer discloses all of the features of the claimed invention except for intermittent rotation of the workpiece. Particularly, the Examiner is of the opinion that Meyer discloses: a first drive for intermittently rotating the workpiece at elements 47-50; a second drive for rotating the tool at elements 29-37; and an electronic control at element 16. The Examiner contends that Krapfenbauer discloses intermittent rotation of the workpiece, and that it would have been obvious to modify Meyer based upon the teachings of Krapfenbauer.

Applicants disagree with the conclusion of obviousness and submit that Meyer and Krapfenbauer fail to disclose or reasonably suggest the combination of features recited in claim 11. More specifically, Applicants submit that Meyer and Krapfenbauer, alone or in combination, fail to disclose or suggest: (i) *a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool*; (ii) *an electronic control operably connected to the first drive and the second drive*; or (iii) *the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit*.

Contrary to the Examiner's assertions, Meyer does not disclose or suggest *a first drive structured and arranged to intermittently rotate the workpiece holder and a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool*, as recited in claim 11. Instead, Meyer discloses a machine in which a tool 1 held in a toolholder 3

is used to cold form a workpiece A. A single drive, i.e., motor 46, causes both rotation of the tool 1 and rotation of the workpiece A through various gear trains. For example, motor 46 causes rotation of the workpiece through gears 47-50 (FIG. 8 and lines 58-64 of col. 3). The same motor 46 also causes rotation of the forming tool through gears 39-45 (FIG. 8 and lines 53-57 of col. 3). Thus, in Meyer, the same drive (motor 46) causes both rotation of the workpiece holder and rotation of the forming tools. Therefore, Meyer does not disclose a first drive for intermittently rotating the workpiece holder and a second drive, separate from the first drive, for rotating the forming tool, as recited in claim 11.

Complex gearing systems driven by a single drive motor, such as that shown by Meyer, are discussed with respect to FIG. 1 of the instant application. Such gearing systems have the disadvantage that only a single toothing profile can be formed with any one gear arrangement. To provide a different toothing profile (e.g., on a different workpiece), the gear ratio between the single drive and the workpiece holder must be adjusted, which can only be carried out by exchange of the corresponding gears or gearing parts. Such an exchange is time consuming and very cost intensive.

In contrast to Meyer, in embodiments of the claimed invention, a first drive (e.g., drive 11, FIG. 2) intermittently rotates the workpiece holder (e.g., 2). A second drive (e.g., drive 8) rotates the forming tools (e.g., 9). The second drive is separate from the first drive. By using separate drives, instead of a single drive and a complex gearing as shown in Meyer, implementations of the invention permit different profiling of workpieces without having to go through the time and expense of changing the gears (as are required in Meyer).

In the event that the Examiner is interpreting the term “drive” to include gear trains (e.g., elements 47-50 of Meyer), Applicants still submit that the “drives” identified by the Examiner

are not separate from one another. Instead, all of the “drives” identified by the Examiner are interconnected to one another and are driven by the same motor 46 and, therefore, are not separate.

In addition to failing to disclose a second drive for rotating the forming tool separate from the first drive for intermittently rotating the workpiece holder, Applicants also submit that Meyer fails to disclose or suggest *an electronic control operably connected to the first drive and the second drive*, as further recited in claim 11. Contrary to the Examiner’s assertions, element 16 of Meyer is not an *electronic control*. Instead, element 16 is a motor for moving the toolholder 3 along the elliptical path C (col. 3, lines 3-16). There is no suggestion that motor 16 is an electronic control.

Moreover, even if motor 16 is construed as an electronic control, there is no teaching that motor 16 is operably connected to what the Examiner identifies as the first and second “drives” (i.e., elements 47-50 and 29-37). That is to say, motor 16 does not influence the operation of gear trains 47-50 and 29-37, and motor 16 does not control rotational movement of the workpiece holder 12. Therefore, Meyer does not disclose *an electronic control operably connected to the first drive and the second drive, which controls intermittent rotational movement of the workpiece holder based upon the second drive*, as recited in claim 11.

In addition to the above-noted deficiencies of Meyer, Applicants also submit that Meyer fails to disclose *the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit that is oriented parallel or obliquely to the longitudinal axis of the workpiece*. Meyer explicitly teaches that the tool 1 is moved in a path C having the shape of a flat ellipse (FIGS. 1 and 8, and lines 13-16 of col. 3). Since a flat ellipse is different from a circular orbit, Meyer does not disclose a circular orbit. One of ordinary skill in

the art would recognize that this is due to the fact that Meyer's cold-forming takes place in a *kneading* way, as opposed to a *hammering* way as provided for by the circular orbit in embodiments of the claimed invention. Thus, in addition to Meyer not disclosing a circular orbit, it also would not have been obvious to change Meyer's elliptical path to a circular orbit.

Krapfenbauer does not disclose or suggest the subject matter noted above as deficient in Meyer. More specifically, Krapfenbauer does not disclose or suggest: *a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool to act periodically on the workpiece; an electronic control operably connected to the first drive and the second drive, which controls intermittent rotational movement of the workpiece holder based upon the second drive; or the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit that is oriented parallel or obliquely to the longitudinal axis of the workpiece.* Therefore, the applied art fails to disclose the combination of features recited in independent claim 11.

Independent Claim 23

Independent claim 23 recites, in pertinent part:

... controlling, with an electronic control, a first drive that causes the intermittent rotating and a second drive that causes movement of the at least one forming tool,

wherein the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit that is oriented parallel or obliquely to the longitudinal axis of the workpiece.

As discussed above, Meyer does not disclose an electronic control. Contrary to the Examiner's assertions, Meyer's motor 16 is not an electronic control. Moreover, even if motor 16 is construed as an electronic control, motor 16 does not control a first drive that causes the intermittent rotating [of the workpiece holder] and a second drive that causes movement of the at

least one forming tool. To the contrary, motor 16 has nothing to do with the rotation of the workpiece holder 12. Therefore, Meyer does not disclose the controlling step recited in claim 23.

Additionally, as discussed above, Meyer does not disclose the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit. Instead, Meyer discloses a flat elliptical path, with is not a circular orbit.

Krapfenbauer, as set forth above, does not cure these deficiencies of Meyer. Therefore, the applied art fails to disclose or suggest the combination of features recited in claim 23.

Independent Claim 30

Independent claim 30 recites, in pertinent part:

... a first drive structured and arranged to intermittently rotate the workpiece holder about a longitudinal axis of a workpiece held in the workpiece holder;

a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool to act periodically on the workpiece; and

a third drive structured and arranged to axially advance the workpiece holder along the longitudinal axis,

wherein the first, second, and third drives are electronically coupled with one another and connected with an electronic control which controls intermittent rotational movement of the workpiece holder.

As discussed above, Meyer does not disclose a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool to act periodically on the workpiece. Instead, Meyer discloses a single drive (motor 46) that drives a gear system, which controls both the rotation of the workpiece holder and the rotation of the forming tool.

Additionally, as discussed above, Meyer does not disclose an electronic control. Meyer's motor 16 is no an electronic control. Moreover, even if motor 16 is construed as an electronic control, motor 16 does not control intermittent rotational movement of the workpiece holder. To the contrary, motor 16 has nothing to do with the rotation of the workpiece holder 12.

Krapfenbauer, as set forth above, does not cure these deficiencies of Meyer. Therefore, the applied art fails to disclose or suggest the combination of features recited in claim 30.

Dependent Claims 12-18, 22, and 24-29

Claims 12-18, 22, and 24-29 depend from independent claims 11 and 23, respectively, and are distinguishable from the applied art at least for the reasons discussed above with respect to the independent claims. Moreover, the applied art fails to disclose or suggest many of the features recited in the dependent claims.

Accordingly, Applicants respectfully request that the §103 rejection of claims 11-18, 22, and 23-30 be withdrawn.

Claims 19-21 in view of Meyer, Krapfenbauer, and Schuler

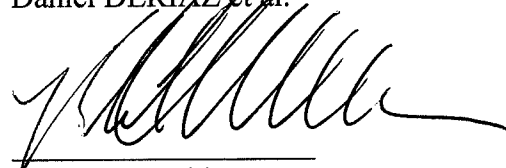
Claims 19-21 depend from independent claim 11, and are distinguishable from the applied art at least for the reasons discussed above with respect to the independent claim. Schuler does not disclose or suggest the subject matter of claim 11 noted above as deficient in Meyer and Krapfenbauer. More specifically, Schuler does not disclose or suggest at least: *a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool to act periodically on the workpiece; or, an electronic control operably connected to the first drive and the second drive, which controls intermittent rotational movement of the workpiece holder based upon the second drive;*. Therefore, the applied art fails to disclose the combination of features recited in independent claims 19-21, which depend from claim 11.

Accordingly, Applicants respectfully request that the §103 rejection of claims 19-21 be withdrawn.

CONCLUSION

In view of the foregoing remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby make a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 19-0089.

Respectfully submitted,
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